UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,949	06/21/2007	Takeshi Sakamoto	46884-5520 (232061)	1891

55694 7590 04/14/2009

DRINKER BIDDLE & REATH (DC)
1500 K STREET, N.W.
SUITE 1100
WASHINGTON, DC 20005-1209

EXAMINER	
KHAN, FARID H	

ART UNIT	PAPER NUMBER
2893	

MAIL DATE	DELIVERY MODE
04/14/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/594,949	SAKAMOTO ET AL.	
	Examiner	Art Unit	
	FARID KHAN	2893	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *29 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *22-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *22-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09-29-2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Oath/Declaration

1. The oath/declaration filed on 06/21/2007 is acceptable.

Drawings

2. The formal drawings filed on 09/29/2006 are acceptable.

Priority

3. Acknowledgement is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d) and (f), through foreign application JAPAN 2004-100931 filed 03/30/2004.

Information Disclosure Statement

4. The Information Disclosure Statements filed on 09/29/2006 and 09/29/2008 have been considered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 22-26, 29, 36-37, 39-41, and 43** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 22-25, and 39-40 the recitations "…distance between the front face and an end part on the front face side…" is not clear to the examiner. For examining purposes it will be assumed to read "…distance between the front face of the

substrate and an end part of the first modified region on the front face side of the substrate…".

Regarding claims 26, 29, 41, and 43 the recitations "…distance between the front face and an end part on a rear face side…" is not clear to the examiner. For examining purposes it will be assumed to read "…distance between the front face of the substrate and an end part of the first modified region on a rear face side of the substrate…"

Regarding claims 36 and 37, line 3 the recitations "…from the rear face…" is not clear to the examiner. For examining purposes it will be assumed to read "…from the rear face side of the substrate…"

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. **Claims 22- 46** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuyo et al. (US PGPUB 2004/0002199; from hereinafter "Fukuyo") in view of Iri et al. (US Patent 7,211,526; from hereinafter "Iri").

Regarding claim 22 Fukuyo teaches a laser processing method (Para [0003]) of irradiating (Para [0009]) a substrate having a front face (3, Fig. 2) formed with a laminate part (part formed with various deposited circuit layers, Figs. 19 and 20; Para [0302]) including a plurality of functional devices (Para [0024]) with laser light while locating a light-converging point (Para [0024]) within the substrate so as to form a modified region (Para [0009]) to become a start point for cutting within the substrate along a line to cut of the substrate (Para [0009]), the method comprising the steps of: forming a first modified region along the line to cut (Para [0075]) and forming at least

one row of a second modified region (Para [0479] along the line to cut at a position between the first modified region and a rear face of the substrate (Fig. 90).

Fukuyo does not teach that a first modified region along the line to cut at a position where a distance between the front face and an end part on the front face side is 5 um to 15 um.

Iri teaches that a distance between the front face and an end part of the first modified region on the front face side is 10 um to 100 um (Fig. 16a).

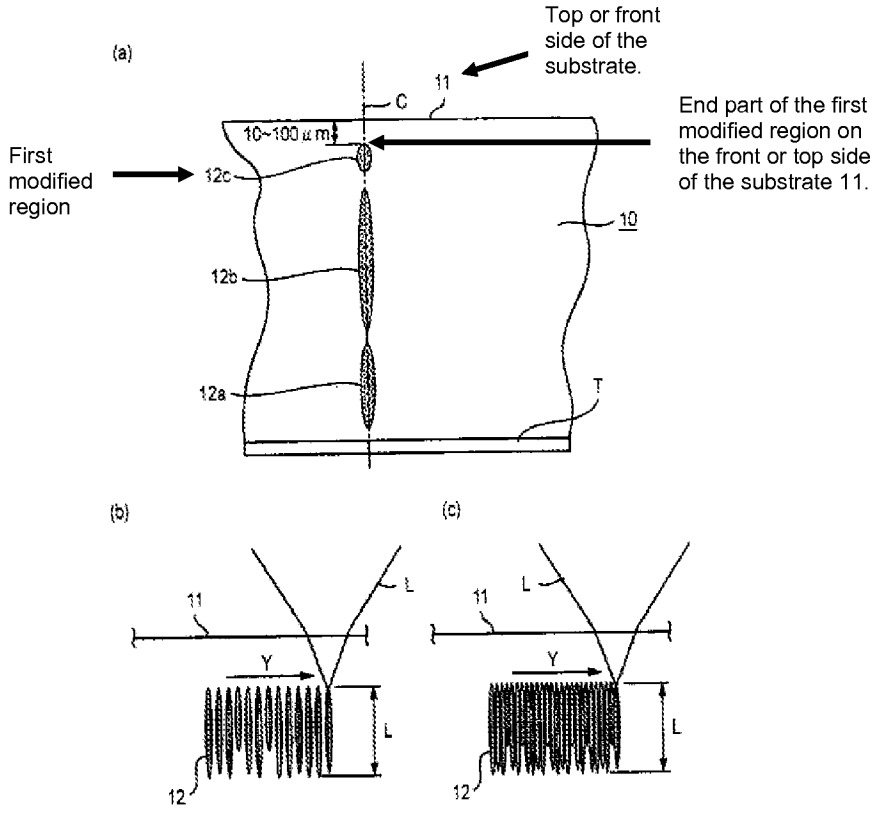

FIG.16

In view of the teachings of Iri it would have been obvious to one of ordinary skill in the art at the time the invention was made that a first modified region along the line to cut at a position where a distance between the front face and an end part on the front face side is 5 um to 15 um. Finding the suitable distance will depend on the type of the substrate being used, the thickness of the substrate, the energy and the wavelength of the laser beam being used, if a modified region is being formed properly or that the laser energy melting unwanted part etc and is within the general skill of the art.125

Regarding claim 23 Fukuyo teaches a laser processing method (Para [0003]) and a first modified region (Fig. 90, Para [0479]).

Fukuyo does not teach that a first modified region is formed at a position where the distance between the front face and the end part on the front face side is 5 um to 10 um.

Iri teaches that a distance between the front face and an end part of the first modified region on the front face side is 5 um to 10 um (Fig. 16a).

In view of the teachings of Iri it would have been obvious to one of ordinary skill in the art at the time the invention was made that a first modified region along the line to cut at a position where a distance between the front face and an end part on the front face side is 5 um to 10 um. Finding the suitable distance will depend on the type of the substrate being used, the thickness of the substrate, the energy and the wavelength of the laser beam being used, if a modified region is being formed properly or that the laser energy melting unwanted part etc and is within the general skill of the art.

Regarding claim 24 Fukuyo teaches a laser processing method (Para [0003]) of irradiating (Para [0009]) a substrate having a front face (3, Fig. 2) formed with a laminate part (part formed with various deposited circuit layers, Figs. 19 and 20; Para [0302]) including a plurality of functional devices (Para [0024]) with laser light while locating a light-converging point (Para [0024]) within the substrate so as to form a modified region (Para [0009]) to become a start point for cutting within the substrate along a line to cut of the substrate (Para [0009]), the method comprising the steps of forming a first modified region along the line to cut (Para [0075]).

Fukuyo does not teach that a first modified region along the line to cut at a position where a distance between the front face and an end part on the front face side is 5 um to 15 um.

Iri teaches that a distance between the front face and an end part of the first modified region on the front face side is 10 um to 100 um (Fig. 16a).

In view of the teachings of Iri it would have been obvious to one of ordinary skill in the art at the time the invention was made that a first modified region along the line to cut at a position where a distance between the front face and an end part on the front face side is 5 um to 15 um. Finding a suitable distance will depend on the type of the substrate being used, the thickness of the substrate, the energy and the wavelength of the laser beam being used, if a modified region is being formed properly or that the laser energy melting unwanted part etc and is within the general skill of the art.

Regarding claim 25 Fukuyo teaches a laser processing method (Para [0003]) and a first modified region (Fig. 90, Para [0479]).

Fukuyo does not teach that a first modified region is formed at a position where the distance between the front face and the end part on the front face side is 5 um to 10 um.

Iri teaches that a distance between the front face and an end part of the first modified region on the front face side is 5 um to 10 um (Fig. 16a).

In view of the teachings of Iri it would have been obvious to one of ordinary skill in the art at the time the invention was made that a first modified region along the line to cut at a position where a distance between the front face and an end part on the front face side is 5 um to 10 um. Finding the suitable distance will depend on the type of the substrate being used, the thickness of the substrate, the energy and the wavelength of the laser beam being used, if a modified region is being formed properly or that the laser energy melting unwanted part etc and is within the general skill of the art.

Regarding claims 26-28 Fukuyo teaches a laser processing method (Para [0003]) of irradiating (Para [0009]) a substrate having a front face (3, Fig. 2) formed with a laminate part (part formed with various deposited circuit layers, Figs. 19 and 20; Para [0302]) including a plurality of functional devices (Para [0024]) with laser light while locating a light-converging point (Para [0024]) within the substrate so as to form a modified region (Para [0009]) to become a start point for cutting within the substrate along a line to cut of the substrate (Para [0009]), the method comprising the steps of: forming a first modified region along the line to cut (Para [0075]) and forming at least one row of a second modified region (Para [0479] along the line to cut at a position between the first modified region and a rear face of the substrate (Fig. 90).

Fukuyo does not teach that a first modified region is formed at a position where the distance between the front face and an end part on a rear face side is

(Claim 26) [(the substrate thickness) x 0.1] um to [20 + (the substrate thickness) x 0.1] um, and

(Claim 27) [5 + (the substrate thickness) x 0.1] um to [20 + (the substrate thickness) x 0.1] um, and

(Claim 28) [5 + (the substrate thickness) x 0.1] um to [10 + (the substrate thickness) x 0.1] um.

Comment [A1]: Does claim 27 further limit claim 26? If it does not, there is a warning of double patenting. Otherwise, the parts which are different from that of claim 26 should be identified. ---- Yes

Comment [A2]: See claim 27

Iri teaches that a distance between the front face and an end part of the first modified region on the front face side is 10 um to 100 um (Fig. 16a).

In view of the teachings of Iri it would have been obvious to one of ordinary skill in the art at the time the invention was made that a first modified region along the line to cut at a position where a distance between the front face and an end part on the front face side is [(the substrate thickness) x 0.1] um to [20 + (the substrate thickness) x 0.1] um, and [5 + (the substrate thickness) x 0.1] um to [20 + (the substrate thickness) x 0.1] um, and [5 + (the substrate thickness) x 0.1] um to [10 + (the substrate thickness) x 0.1] um.

Finding a suitable distance will depend on the type of the substrate being used, the thickness of the substrate, the energy and the wavelength of the laser beam being used, if a modified region is being formed properly or that the laser energy melting unwanted part etc and is within the general skill of the art.

Regarding claims 29-31 Fukuyo teaches a laser processing method (Para [0003]) of irradiating (Para [0009]) a substrate having a front face (3, Fig. 2) formed with a laminate part (part formed with various deposited circuit layers, Figs. 19 and 20; Para [0302]) including a plurality of functional devices (Para [0024]) with laser light while locating a light-converging point (Para [0024]) within the substrate so as to form a modified region (Para [0009]) to become a start point for cutting within the substrate along a line to cut of the substrate (Para [0009]), the method comprising the steps of forming a first modified region along the line to cut (Para [0075]).

Fukuyo does not teach that a first modified region is formed at a position where the distance between the front face and an end part on a rear face side is

(Claim 29) [(the substrate thickness) x 0.1] um to [20 + (the substrate thickness) x 0.1] um, and

(Claim 30) [5 + (the substrate thickness) x 0.1] um to [20 + (the substrate thickness) x 0.1] um, and

Comment [A3]: See claim 27 — yes

(Claim 31) [5 + (the substrate thickness) x 0.1] um to [10 + (the substrate thickness) x 0.1] um.

Comment [A4]: See claim 27 —Yes

Iri teaches that a distance between the front face and an end part of the first modified region on the front face side is 10 um to 100 um (Fig. 16a) and the length (C, Fig. 20) of the first modified region (Fig. 20). That is the distance between the front face and an end part of the first modified region on the front face side is [C + (10 um to 100 um)].

In view of the teachings of Iri it would have been obvious to one of ordinary skill in the art at the time the invention was made that a first modified region along the line to cut at a position where a distance between the front face and an end part on the front face side is

(Claim 29) [(the substrate thickness) x 0.1] um to [20 + (the substrate thickness) x 0.1] um, and

(Claim 30) [5 + (the substrate thickness) x 0.1] um to [20 + (the substrate thickness) x 0.1] um, and

(Claim 31) [5 + (the substrate thickness) x 0.1] um to [10 + (the substrate thickness) x 0.1] um.

Finding a suitable distance will depend on the type of the substrate being used, the thickness of the substrate, the energy and the wavelength of the laser beam being used, if a modified region is being formed properly or that the laser energy melting unwanted part etc and is within the general skill of the art.

Regarding claim 32 Fukuyo teaches a laser processing method (Para [0003]) wherein the substrate is a semiconductor substrate (Para [0026]), and wherein the first and second modified regions (Para [00479]) include a molten processed region (Para [0072] and [0253]).

Regarding claim 33 Fukuyo teaches a laser processing method (Para [0003]) wherein the first and second modified regions are successively formed (Para [102]) one by one from the side farther from the rear face while using the rear face as a laser light entrance surface (Para [105] and [298]).

Regarding claims 34-35 Fukuyo teaches a laser processing method (Para [0003]) wherein the intensity of laser light has an energy of peak power density of at least $1x10^8$ (W/cm^2).

Fukuyo does not teach wherein the laser light has an energy of 2 uJ to 50 uJ when forming the first modified region and an energy of 1 uJ to 50 uJ when forming the second modified region.

It is well known in the art that the energy of the laser light will depend on many factors like the wave length of the laser light, the thickness of the substrate to be cut apart, the location of the molten or modified region to be formed, and the amount of damage the semiconductor layers can withstand with the respective laser light energy etc.

In view of the teachings of Fukuyo it would have been obvious to one of ordinary skill in the art at the time the invention was made wherein the laser light has an energy of 2 uJ to 50 uJ when forming the first modified region and an energy of 1 uJ to 50 uJ when forming the second modified region.

Finding a suitable laser light energy will depend on the type of the substrate being used, the thickness of the substrate, the energy and the wavelength of the laser beam being used, if a modified region is being formed properly or that the laser energy melting unwanted part etc and is within the general skill of the art.

Regarding claims 36-37 Fukuyo does not teach a laser processing method wherein the light- converging point of the laser light is located at a position distanced by

(Claim 36) 50 um to [(the substrate thickness) x 0.9] um from the rear face when forming the second modified region; and

(Claim 37) 20 um to 110 um from the rear face when forming the second modified region.

Iri teaches the distance of the light- converging point of the laser light from the front face is in the range of 20-100 um (Fig. 17). Iri fails to teach this distance measured from the rear face.

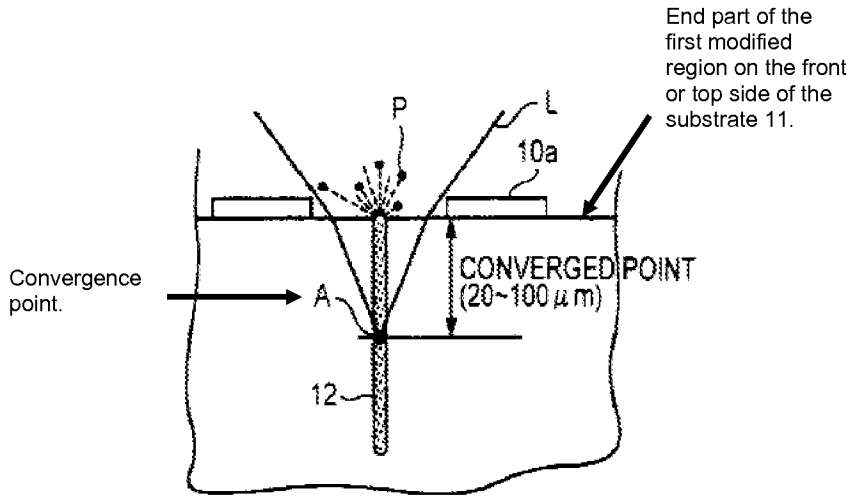

FIG.17

In view of the teachings of Iri it would have been obvious to one of ordinary skill in the art at the time the invention was made that the laser light is located at a position distanced by

50 um to [(the substrate thickness) x 0.9] um from the rear face when forming the second modified region; and

20 um to 110 um from the rear face when forming the second modified region.

Comment [A5]: Motivation?--Done

Comment [A6]: Motivation? –Same as above

This will ensure that the second modified region is not too far from the modified region closest to the rear face else the splitting of the wafer starting from the rear side of the wafer may not occur properly.

Regarding claim 38 Fukuyo teaches a laser processing method (Para [0003]) further comprising the step of cutting the substrate (1, Fig. 2) and laminate part (part formed with various deposited circuit layers, Figs. 19 and 20; Para [0302]) along the line to cut (Para [0009]).

Regarding claim 39 Fukuyo teaches a semiconductor chip (Para [0292]) comprising a substrate (1, Fig. 17); and a laminate part (part formed with various deposited circuit layers, Figs. 19 and 20; Para [0302]), disposed on a front face (3, Fig. 17) of the substrate (1, Fig. 17), including a functional device (Para [0022]); wherein a first modified region (Para [0075]) extending along a rear face of the substrate is formed (Fig. 90) and wherein at least one row of a second modified region (9B, Fig. 90) extending along the rear face (21, Fig. 90) is formed (Para [0479]) at a position between the first modified region (9A, Fig. 90) and the rear face (21, Fig. 90) in the side face (Fig. 90) of the substrate (1, Fig. 90).

Fukuyo does not teach where a distance between the front face and an end part on the front face side is 5 um to 15 um in a side face of the substrate.

Iri teaches that a distance between the front face and an end part of the first modified region on the front face side is 10 um to 100 um (Fig. 16a).

In view of the teachings of Iri it would have been obvious to one of ordinary skill in the art at the time the invention was made that a first modified region extending along a rear face of the substrate is formed at a position where a distance between the front face and an end part on the front face side is 5 um to 15 um in a side face of the substrate.

Finding the suitable distance will depend on the type of the substrate being used, the thickness of the substrate, the energy and the wavelength of the laser beam being used, if a modified region is being formed properly or that the laser energy melting unwanted part etc and is within the general skill of the art.

Regarding claim 40 Fukuyo teaches a semiconductor chip (Para [0292]) comprising a substrate (1, Fig. 17); and a laminate part (part formed with various deposited circuit layers, Figs. 19 and 20; Para [0302]), disposed on a front face (3, Fig. 17) of the substrate (1, Fig. 17), including a functional device (Para [0022]); wherein a first modified region (Para [0075]) extending along a rear face of the substrate is formed (Fig. 90).

Fukuyo does not teach where a distance between the front face and an end part on the front face side is 5 um to 15 um in a side face of the substrate.

Iri teaches that a distance between the front face and an end part of the first modified region on the front face side is 10 um to 100 um (Fig. 16a).

In view of the teachings of Iri it would have been obvious to one of ordinary skill in the art at the time the invention was made that a first modified region extending along a rear face of the substrate is formed at a position where a distance between the front face and an end part on the front face side is 5 um to 15 um in a side face of the substrate.

Finding the suitable distance will depend on the type of the substrate being used, the thickness of the substrate, the energy and the wavelength of the laser beam being used, if a modified region is being formed properly or that the laser energy melting unwanted part etc and is within the general skill of the art.

Regarding claim 41-44 Fukuyo teaches a semiconductor chip (Para [0292]) comprising a substrate (1, Fig. 17); and a laminate part (part formed with various deposited circuit layers, Figs. 19 and 20; Para [0302]), disposed on a front face (3, Fig. 17) of the substrate (1, Fig. 17), including a functional device (Para [0022]); wherein a first modified region (Para [0075]) extending along a rear face of the substrate is formed (Fig. 90); and wherein at least one row of a second modified region (9B, Fig. 90) extending along the rear face (21, Fig. 90) is formed (Para [0479]) at a position between the first modified region (9A, Fig. 90) and the rear face (21, Fig. 90) in the side face (Fig. 90) of the substrate (1, Fig. 90).

Fukuyo does not teach wherein a first modified region extending along a rear

face of the substrate is formed at a position where a distance between the front face and an end part on the rear face side is

(Claim 41) [(the substrate thickness) x 0.1] um to [20 + (the substrate thickness) x 0.1] um, and

(Claim 42) [5 + (the substrate thickness) x 0.1] um to [20 + (the substrate thickness) x 0.1] um, and

(Claim 43) [(the substrate thickness) x 0.1] um to [20 + (the substrate thickness) x 0.1] um, and

(Claim 44) [5 + (the substrate thickness) x 0.1] um to [10 + (the substrate thickness) x 0.1] um.

Iri teaches that a distance between the front face and an end part of the first modified region on the front face side is 10 um to 100 um (Fig. 16a) and the length of the first modified region is C (Fig. 20). That is the distance between the front face and an end part of the first modified region on the rear face side is [C + I + the depth of the scratch, where, (I+ depth of scratch) = (10 um to 100 um)]; and C <2I.

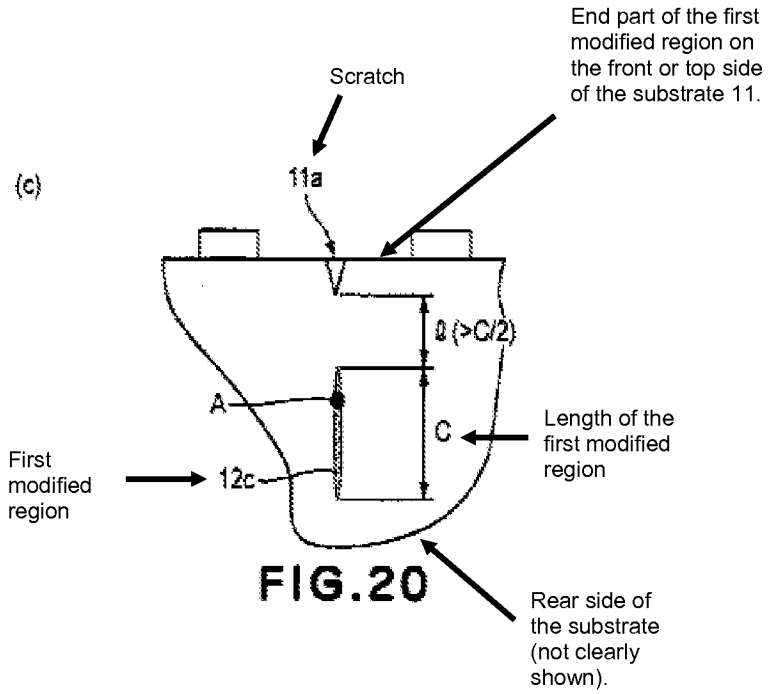

FIG.20

In view of the teachings of Iri it would have been obvious to one of ordinary skill in the art at the time the invention was made wherein a first modified region extending along a rear face of the substrate is formed at a position where a distance between the front face and an end part on the rear face side is:

(Claim 41) [(the substrate thickness) x 0.1] um to [20 + (the substrate thickness) x 0.1] um, and

(Claim 42) [5 + (the substrate thickness) x 0.1] um to [20 + (the substrate thickness) x 0.1] um, and

(Claim 43) [(the substrate thickness) x 0.1] um to [20 + (the substrate thickness) x 0.1] um, and

(Claim 44) [5 + (the substrate thickness) x 0.1] um to [10 + (the substrate thickness) x 0.1] um.

Finding a suitable distance will depend on the type of the substrate being used, the thickness of the substrate, the energy and the wavelength of the laser beam being used, if a modified region is being formed properly or that the laser energy melting unwanted part etc and is within the general skill of the art.

Regarding claim 45 Fukuyo teaches a laser processing method (Para [0003]) wherein the substrate is a semiconductor substrate (Para [0026]), and wherein the first and second modified regions (Para [00479]) include a molten processed region (Para [0072] and [0253]).

Regarding claim 46 Fukuyo teaches a semiconductor chip (Para [0292]) wherein the distance between the end part of the first modified region (9A, Fig. 90) on the rear face (21, Fig. 90) side and the end part of the second modified region (9B, Fig. 90) on the front face side (3, Fig. 90) opposing each other is 0 um to [(the substrate thickness) - (the substrate thickness) x 0.6] um.

Fukuyo does not teach that wherein the distance between the end part of the first modified region on the rear face side and the end part of the second modified region on

the front face side opposing each other is 0 um to [(the substrate thickness) - (the substrate thickness) x 0.6] um.

Iri teaches (Para [100] and Para [124]) that the length of the modified regions vary (Fig. 16). It is obvious from the teachings of Iri that the length of the first modified region and the second modified region may vary and touch each other. In other words the distance between the distance between the end part of the first modified region on the rear face side and the end part of the second modified region on the front face side opposing each other is 0 um. Iri does not teach the range of the gap between the first modified region and the second modified region opposing each other.

In view of the teachings of Iri it would have been obvious to one of ordinary skill in the art at the time the invention was made wherein the distance between the end part of the first modified region on the rear face side and the end part of the second modified region on the front face side opposing each other is 0 um to [(the substrate thickness) - (the substrate thickness) x 0.6] um. If the gap between the first modified region and the second modified region opposing each other is substantial, the substrate may not split or break properly along the line of interest.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to FARID KHAN whose telephone number is (571)270-7437. The examiner can normally be reached on 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Davienne Monbleau can be reached on (571) 272-1945. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Farid Khan/
Examiner, Art Unit 2893
April 6, 2009

/A. Sefer/
Primary Examiner
Art Unit 2893